Internet Appendix for:
"Cyclical Dispersion in Expected Defaults"

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Contents

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1 Robustness Tests

The results presented in the main text are robust to the definition of debt repayments, and the inclusion of other variables. The results are also robust to the choice of frequency. In this latter case, portfolios are constructed directly using Compustat annual data. The following empirical results are run on non-financial non-regulated companies only.

1.1 Cash-flows to Debtholders

Table 1 and Table 2 reports the predictability results at annual frequency, when debt repayment is computed using the statement of cash-flows data. Debt repayment is long term debt repayed (*dltr*) plus interest paid (*xint*) minus long term debt issued (*dltis*) and change in short term debt (*dlcch*). Regressions involving macroeconomic aggregates control for the dependent variable between time $t-1$ and t. Excess Bond return regressions control for GDP between time $t-1$ and t.

1.2 Credit Spread Predictability

Table 3 throught 5 reproduce the credit spread predictability on the data and in the model. In the data, Gilchrist and Zakrajšek (2012) spread or EBP are the data posted by Gilchrist and Zakrajšek. BAA minus AAA instead is computed as Moody's Seasoned Baa Corporate Bond Yield (BAA) minus Moody's Seasoned Aaa Corporate Bond Yield (AAA), both retrieved from FRED. In the model we construct these indexes as follows. Gilchrist and Zakrajšek (2012) spread is a simple unweighted cross-sectional average of all credit spreads in the economy. Gilchrist and Zakrajšek (2012) EBP is constructed by first subtracting the probability of default times the loss given default (one minus the recovery rate) from credit spreads, and then taking a simple unweighted cross-sectional average of them. Both constructions follow closely the definitions in Gilchrist and Zakrajšek (2012). As to BAA minus AAA, we approximate it with the difference in yields between High Yield firms and Investment grade firms, as defined in the main text (top one-fifth of EDF versus bottom four-fifth of EDF).

1.3 Alternative Default Probability Models

In Table 6 and 7, we reproduce the results for the predictability regressions when dispersion computed from the estimates by Campbell, Hilscher, and Szilagyi (2008) (Table IV, 0 lag) is used.

1.4 Multivariable Forecasting of Macroeconomic Quantities

Table 10 presents the results from a host of additional robustness tests for the OLS predictability regression of output (Panel A) and investment growth (Panel B) at 1 quarter and 2 quarters. As independent variables, we use other economic series that have been empirically found helpful predictors of the economic cycle.

In column (a) we forecast macroeconomic quantities using only the average Expected Default Frequency of net repayers. The estimate exhibits a negative sign and is statistically significant at 1% level in all the cases. In column (b) we regress the same variables onto *Dispersion*, as shown in the main text. In column (c) we forecast the macroeconomic quantities using *Dispersion* and the Gilchrist and Zakrajšek (2012) Excess Bond Premium. Results are impaired by the high collinearity between the two series. *Dispersion*, which is a naive linear combination of the EDF of repayers and the one of issuers and not the one maximally correlated with EBP, has a correlation of 0.65 with EBP. In column (d) we regress the macroeconomic series onto *Dispersion*, the log of the price-dividend ratio, the term spread and the lagged dependent variable. *Dispersion* remains statistically and economically significant.

1.5 Annual Portfolios

In this section, we present the OLS regression estimates from predicting macroeconomic quantities and bond returns using both our *Dispersion* measure and Greenwood and Hanson (2013) *ISSEDF*. Results align with the quarterly estimates presented in the main text. Please notice that Greenwood and Hanson measure is a decile-based measure and not a probability measure, which requires a different interpretation of the coefficient estimates compared to ours. Furthermore, please notice that Greenwood and Hanson subtract the average EDF decile of repayers from the average EDF decile of issuers, while we subtract the average EDF of issuers from the one of repayers (as repayers have always a higher average EDF). The interpretation with their measure is as follows: when firms with high net debt issuance have EDFs that are on average one decile higher than firms with low net debt issuance, excess returns on high yield bonds is expected to be 12% lower next year and excess returns on investment grade bonds 2% lower.

2 Additional Empirical Results

This section reports a few additional results concerning *Dispersion* in credit quality and other dispersion measures based on individual firms' credit-risk.

Figure 2 plots both the CBOE VIX and our main dispersion measure (based on debt repayers and issuers). Dispersion is closely related to the CBOE Volatility Index but there are some periods, like the early 90s or 2015, where a higher volatility did not necessarily imply higher default risk and vice-versa.

Table 13 demonstrates that *Dispersion* in credit quality (the one based on debt repayment) is also a strong predictor of unemployment growth.

Table 14 reports the results from out-of-sample predictability of bond returns. To interpret the economic significance of such results we use the formula suggested by Cochrane (1999). It can be proven that the Sharpe ratio (s^*) earned by an investor who uses the entire information from those predictability regressions (R^2) and the Sharpe ratio (s_0) otherwise earned via a buy-and-hold strategy are related according to the following formula

$$s^* = \sqrt{\frac{s_0^2 + R^2}{1 - R^2}}$$

Given an annualized Sharpe ratio for the buy-and-hold strategy of 0.375 (obtained multiplying the quarterly Sharpe ratio by $\sqrt{2}$) and a predictive quarterly R^2 of 5.3%, the implied annualized Sharpe ratio for an active investor is about 0.51. As regards investment-grade bonds, the annualized Sharpe ratio for a buy and hold strategy equals 0.54 and once we account for the predictive information available to investors, we observe that an active investor could reach a Sharpe ratio of 0.61. In the same table we report the 25–75 confidence interval of the R^2 statistics based on 1000 bootstrapped samples of the same size of the actual sample used for the estimation.

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Table 1. Forecasting Macroeconomic Quantities: Cash flow to debtholders

	Horizon k (years)	
	1	2
Panel A: Δ GDP $_{t\to t+k}$		
β_1	-0.27^{**}	-0.14^{*}
	[−2.62]	[−1.81]
R^2	0.283	0.130
Panel B: Δ Investment $_{t\to t+k}$		
β_1	-1.21^{***}	-0.67^{***}
	[−3.92]	[−3.05]
R^2	0.315	0.154

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \,\text{Dispersion}_t + \beta_2 \,\Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports the slope coefficients and R^2 statistics from predictive regressions of average GDP growth (Panel A) and Investment growth (Panel B) over various horizons onto dispersion in credit quality (*Dispersion*) and growth in the dependent variable between time t and $t-1$. We define dispersion in four different ways. Dispersion is the average EDF of firms in the higher quintile of cashflows to debtholders minus the average EDF of firms in the lowest. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively.

Table 2. Forecasting Excess Returns on Bonds: Cash flow to debt holders

	Horizon k (years)	
	1	2
Panel A: Investment Grade		
β_1	0.82***	0.64***
	[2.79]	[3.63]
R^2	0.190	0.326
Panel B: High Yield		
β_1	1.86**	1.44**
	[2.16]	[2.61]
R^2	0.237	0.401

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{rx}_{t\to t+k} = \alpha + \beta_1 \,\text{Dispersion}_t + \beta_2 \,\Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports the slope coefficients and R^2 statistics from predictive regressions of average excess log returns on investment grade bonds (Panel A) and high yield bonds (Panel B) over various horizons onto dispersion in credit quality (*Dispersion*) and growth in GDP between time $t-1$ and t. We define dispersion in four different ways. Dispersion is the average EDF of firms in the higher quintile of cashflows to debtholders minus the average EDF of firms in the lowest. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Investment-grade bond data are from January 1976 until September 2013. High-yield bond data are from January 1987 to June 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively.

Table 3.
Forecasting Macroeconomic Quantities: Gilchrist and Zakrajšek (2012) Spread

Horizon k

		1	2	3	4	8
		Panel A: Δ GDP $_{t\to t+k}$				
β_1	Data	-0.17^{***}	-0.14^{*}	-0.12	-0.10	-0.07
		[-2.32]	[-2.77]	[-1.85]	[-1.41]	[-1.14]
	Model	-0.30	-0.21	-0.20	-0.17	-0.10
R^2	Data	0.171	0.168	0.144	0.123	0.050
	Model	0.155	0.327	0.351	0.352	0.271
		Panel B: Δ Investment $_{t\to t+k}$				
β_1	Data	-0.53^{**}	-0.45	-0.31	-0.22	-0.01
		[-2.05]	[-1.45]	[-1.02]	[-0.76]	[-0.04]
	Model	-2.56	-1.25	-0.16	0.43	2.27
R^2	Data	0.233	0.186	0.141	0.093	0.020
	Model	0.188	0.037	0.020	0.027	0.070

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \text{ Credit Spread}_t + \beta_2 \, \Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports the slope coefficients and R^2 statistics from predictive regressions of average GDP (Panel A) and average investment growth (Panel B) over various horizons onto Gilchrist and Zakrajšek (2012) spread and growth in the dependent variable between time $t-1$ and t in the data and onto the average credit spread and lagged dependent variable growth within the model. Gilchrist and Zakrajšek (2012) spread is a simple un-weighted cross-sectional average of credit spreads per each month. We present t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon, in squared parentheses. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively. For the model, simulations are run on $N = 400$ time-series paths of the same length as the empirical sample.

Table 4.
Forecasting Macroeconomic Quantities: BAA minus AAA Credit Spread

Horizon k

		1	2	3	4	8
			Panel A: Δ GDP $_{t\to t+k}$			
β_1	Data	−0.25	−0.10	−0.03	0.05	0.15
		[−1.33]	[−0.55]	[−0.12]	[0.19]	[0.71]
	Model	−0.10	−0.07	−0.06	−0.06	−0.03
R^2	Data	0.148	0.132	0.107	0.094	0.048
	Model	0.157	0.323	0.353	0.353	0.271
			Panel B: Δ Investment $_{t\to t+k}$			
β_1	Data	−0.99	−0.39	0.09	0.35	0.68
		[−1.36]	[−0.54]	[−0.11]	[0.43]	[1.02]
	Model	−0.83	−0.40	−0.03	0.16	0.80
R^2	Data	0.221	0.161	0.124	0.088	0.050
	Model	0.187	0.038	0.019	0.027	0.073

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \text{ Credit Spread}_t + \beta_2 \, \Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports the slope coefficients and R^2 statistics from predictive regressions of average GDP (Panel A) and average investment growth (Panel B) over various horizons onto BAA minus AAA spread and growth in the dependent variable between time $t-1$ and t in the data and onto the difference in credit spreads between high yield and investment grade bonds and lagged dependent variable growth within the model. We present t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon, in squared parentheses. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively. For the model, simulations are run on $N = 400$ time-series paths of the same length as the empirical sample.

Table 5.
Forecasting Macroeconomic Quantities: Gilchrist and Zakrajšek (2012) Excess Bond Premium

		Horizon k				
		1	2	3	4	8
		Panel A: Δ GDP $_{t\to t+k}$				
β_1	Data	-0.35^{***}	-0.29^{**}	-0.23^{*}	-0.16	-0.02
		[−3.06]	[−2.45]	[−1.88]	[−1.37]	[−0.02]
	Model	−0.36	−0.26	−0.23	−0.21	−0.13
R^2	Data	0.180	0.175	0.142	0.113	0.029
	Model	0.156	0.326	0.352	0.355	0.271
		Panel B: Δ Investment $_{t\to t+k}$				
β_1	Data	-1.39^{***}	-1.27^{***}	-0.93^{*}	-0.65	0.19
		[−3.34]	[−2.64]	[−1.90]	[−1.40]	[0.45]
	Model	−3.13	−1.52	−0.18	0.55	2.82
R^2	Data	0.257	0.219	0.164	0.107	0.023
	Model	0.188	0.036	0.020	0.027	0.072

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \,\text{Credit Spread}_t + \beta_2 \,\Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports the slope coefficients and R^2 statistics from predictive regressions of average GDP (Panel A) and average investment growth (Panel B) over various horizons onto Gilchrist and Zakrajšek (2012) excess bond premium and growth in the dependent variable between time $t-1$ and t in the data and onto the average credit spread and lagged dependent variable growth within the model. Gilchrist and Zakrajšek (2012) excess bond premium is a simple un-weighted cross-sectional average of credit spreads net of the credit spread predicted by the default probability per each month. A quarterly average of the series is then considered. In the model the excess bond premium is computed as simple un-weighted cross-sectional average of credit spreads net of the default probability times the loss upon default. We present t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon, in squared parentheses. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively. For the model, simulations are run on $N = 400$ time-series paths of the same length as the empirical sample.

Table 6. Forecasting Macroeconomic Quantities: Campbell, Hilscher, and Szilagyi (2008) hazard model

	Horizon k				
	1	2	3	4	8
Panel A: Δ GDP $_{t\to t+k}$					
β_1	-0.26^{**}	-0.12	-0.05	0.02	0.05
	[−2.41]	[−1.16]	[−0.53]	[0.18]	[0.57]
R^2	0.159	0.137	0.109	0.093	0.033
Panel B: Δ Investment $_{t\to t+k}$					
β_1	-1.15^{***}	-0.77^{*}	-0.34	0.05	0.27
	[−2.98]	[−1.79]	[−0.86]	[0.13]	[0.74]
R^2	0.242	0.181	0.127	0.082	0.024

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \,\text{Distress}_t + \beta_2 \,\Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports coefficients and R^2 statistics from predictive regressions of average GDP (Panel A) and average investment growth (Panel B) over various horizons onto dispersion in credit quality between debt repayers and issuers and growth in GDP between time $t-1$ and t. Credit quality is measured using the distress risk measure based on Campbell, Hilscher, and Szilagyi (2008). We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 7. Forecasting Excess Returns on Bonds: Campbell, Hilscher, and Szilagyi (2008) hazard model

	Horizon k				
	1	2	3	4	8
Panel A: Investment Grade					
β_1	0.74	1.13***	1.03**	0.88**	0.52*
	[1.31]	[2.92]	[2.48]	[2.25]	[1.92]
R^2	0.019	0.117	0.135	0.117	0.088
Panel B: High Yield					
β_1	1.80*	2.72***	2.59**	2.10**	1.13***
	[1.66]	[2.90]	[2.46]	[2.48]	[2.87]
R^2	0.066	0.198	0.231	0.239	0.337

Source: Barclays Capital, Global Financial Data, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{rx}_{t\to t+k} = \alpha + \beta_1 \, \text{Distress}_t + \beta_2 \, \Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports coefficients and R^2 statistics from predictive regressions of average excess log returns on bonds over various horizons onto dispersion in credit quality between debt repayers and issuers and growth in GDP between time $t-1$ and t. Credit quality is measured using the distress risk measure based on Campbell, Hilscher, and Szilagyi (2008). Panel A reports results for investment grade bonds; panel B reports results for high yield bonds. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Investment-grade bond data are quarterly from January 1976 until September 2013. High-yield bond data are quarterly from January 1987 to June 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 8. Forecasting Macroeconomic Quantities: Fin. Debt

	Horizon k				
	1	2	3	4	8
Panel A: GDP					
β	-0.17^{*}	-0.17	-0.16	-0.11	-0.04
	[−1.68]	[−1.41]	[−1.48]	[−1.30]	[−0.66]
R^2	0.1390	0.1362	0.1152	0.0992	0.0326
Panel B: Investment					
β	-0.63^{*}	-0.64	-0.60	-0.41	-0.12
	[−1.72]	[−1.40]	[−1.33]	[−1.10]	[−0.38]
R^2	0.2151	0.1680	0.1345	0.0943	0.0234

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta y}_{t\to t+k} = \alpha + \beta_1 \, \text{Distress}_t + \beta_2 \, \Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports coefficients and R^2 statistics from predictive regressions of average GDP (Panel A) and average investment growth (Panel B) over various horizons onto dispersion in credit quality between debt repayers and issuers and growth in GDP between time $t-1$ and t. Debt repayment is computed as change in short-term debt (*dlccq*) plus change in long term debt (*dlttq*). We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 9. Forecasting Excess Returns on Bonds: Fin. Debt

	Horizon k				
	1	2	3	4	8
			Panel A: Investment Grade		
β	-0.11	0.23	0.48*	0.60**	0.20
	[−0.22]	[0.65]	[1.77]	[2.19]	[1.17]
R^2	0.0007	0.0334	0.0486	0.0522	0.0270
			Panel B: High Yield		
β	−0.06	-0.52	0.68	1.21*	0.02
	[−0.03]	[−0.35]	[0.85]	[1.71]	[0.06]
R^2	0.0426	0.1150	0.1155	0.1587	0.2604

Source: Barclays Capital, Global Financial Data, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{rx}_{t\to t+k} = \alpha + \beta_1 \, \text{Distress}_t + \beta_2 \, \Delta y_{t-1\to t} + \epsilon_{t+k}.$$

The table reports coefficients and R^2 statistics from predictive regressions of average excess log returns on bonds over various horizons onto dispersion in credit quality between debt repayers and issuers and growth in GDP between time $t-1$ and t. Debt repayment is computed as change in short-term debt (*dlccq*) plus change in long term debt (*dlttq*). Panel A reports results for investment grade bonds; panel B reports results for high yield bonds. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Investment-grade bond data are quarterly from January 1976 until September 2013. High-yield bond data are quarterly from January 1987 to June 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 10. Multivariable forecasting - Horizon k quarters

Panel A: $\overline{\Delta\,\text{GDP}}_{t\to t+k}$

	k =1				k =2			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
EDF_t^R	-0.29^{***}				-0.23^{***}			
	[−5.80]				[−4.38]			
Dispersion_t		-0.40^{***}	-0.25^{***}	-0.33^{***}		-0.31^{***}	-0.18^{*}	-0.27^{***}
		[−6.05]	[−2.67]	[−4.55]		[−4.54]	[−1.81]	[−3.59]
EBP_t			-0.31^{**}				-0.28^{*}	
			[−2.38]				[−1.94]	
$\log(\text{pd})_t$				0.001				0.0003
				[0.48]				[0.23]
TS_t				0.12^{**}				0.16^{***}
				[2.17]				[3.75]
$\overline{\Delta\,\text{GDP}}_{t-k\to t}$				0.24^{***}				0.22^{**}
				[2.60]				[2.11]
R^2	0.134	0.124	0.149	0.226	0.121	0.112	0.140	0.263

Panel B: $\overline{\Delta\,\mathrm{I}}_{t\to t+k}$

	k =1				k =2			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
EDF_t^R	-1.26^{***}				-1.00^{***}			
	[−7.48]				[−5.02]			
$\mathrm{Dispersion}_t$		-1.10^{***}	-1.06^{***}	-1.38^{***}		-1.38^{***}	-0.82^{**}	-1.32^{***}
		[−7.11]	[−3.13]	[−5.14]		[−5.16]	[−2.31]	[−4.53]
EBP_t			-1.474^{***}				-1.15^{**}	
			[−2.90]				[−2.33]	
$\log(\mathrm{pd})_t$				0.006				0.005
				[1.23]				[1.13]
TS_t				0.52^{**}				0.70^{***}
				[2.36]				[4.63]
$\overline{\Delta\,\mathrm{I}}_{t-k\to t}$				0.29^{***}				0.16
				[3.02]				[1.32]
R^2	0.192	0.174	0.209	0.335	0.1672	0.1561	0.1921	0.3389

Notes: The table reports coefficients and R^2 statistics from predictive regressions of average GDP growth (Panel A) and average Investment Growth (Panel B) over one and two quarterly horizons for four different specifications. We define dispersion as average EDF of repayers minus average EDF of issuers. EDF_t^R is the average expected default frequency of repayers only. EBP is the quarterly average of the monthly series of Gilchrist and Zakrajšek (2012) excess bond premium. log(pd) is the log of the price-dividend ratio of the CRSP index (all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ). TS refers to the term spread and is computed as the yield (at a quarterly level) on Treasury nominal securities of 10 year "constant maturity" minus the yield (at a quarterly level) on the 3-Month Treasury Bill. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 11. Forecasting Economic Activity: Horizon 1 and 2 year

Panel A: Δ Per Capita GDP$_{t \to t+1}$

	(a)		(b)	
	k =1	k =2	k =1	k =2
β	-0.35^{**}	-0.22	-0.14	-0.35
	[−2.17]	[−1.60]	[−0.22]	[−0.56]
R^2	0.0920	0.0589	0.0009	0.0096

Panel B: Δ Per Capita Investment$_{t \to t+1}$

	(a)		(b)	
	k =1	k =2	k =1	k =2
β	-1.42^{**}	-0.90^{*}	-3.14	-4.24^{*}
	[−2.50]	[−2.03]	[−1.37]	[−1.99]
R^2	0.1096	0.0734	0.0324	0.1046

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: The table presents OLS coefficient estimates and t-statistics in parentheses. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Columns (a) presents the results for the raw measure of *Dispersion* in credit quality. Column (b) is Greenwood and Hanson (2013) ISSEDF. The frequency is annual. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively. Data are from 1973 to 2008.

Table 12. Forecasting Excess Returns on Bonds ($rx_{t \to t+1}$): Horizon 1 and 2 year

Panel A: Investment Grade

	(a)		(b)	
	k =1	k =2	k =1	k =2
β	0.52	0.50	−1.89	−0.73
	[0.99]	[1.43]	[−1.04]	[−0.64]
R^2	0.0229	0.0518	0.0184	0.0067

Panel B: High Yield

	(a)		(b)	
	k =1	k =2	k =1	k =2
β	2.58	3.97***	−12.03**	−10.93***
	[1.53]	[3.64]	[−2.35]	[−4.87]
R^2	0.0932	0.3664	0.1131	0.2572

Source: Barclays Capital, Global Financial Data, CRSP/Compustat merged, CRSP

Notes: The table presents OLS coefficient estimates and t-statistics in parentheses. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Columns (a) presents the results for the raw measure of *Dispersion* in credit quality. Column (b) is Greenwood and Hanson (2013) ISSEDF. The frequency is annual. Investment-grade bond data are from January 1973 until September 2013. High-yield bond data are from January 1987 to June 2013. Statistical significance levels at 10%, 5% and 1% are denoted by *, ** and ***, respectively.

Table 13. Forecasting Macroeconomic Quantities: Dispersion in debt repayment

	Horizon k				
	1	2	3	4	8
			Unemployment		
β_1	1.70***	1.49***	1.23***	1.04**	0.38
	[3.72]	[3.36]	[2.68]	[2.09]	[0.67]
R^2	0.4818	0.4461	0.3760	0.2926	0.1006

Source: Bureau of Economic Analysis, CRSP/Compustat merged, CRSP

Notes: Estimation of

$$\overline{\Delta Unemp.}_{t\to t+k} = \alpha + \beta_1 \, \text{Dispersion}_t + \beta_2 \Delta Unemp._{t-1\to t} + \epsilon_{t+k}.$$

The table reports coefficients and R^2 statistics from predictive regressions of average unemployment growth over various horizons onto dispersion in credit quality (*Dispersion*). We define dispersion as average EDF of repayers minus average EDF of issuers. We construct t-statistics from Newey and West (1987) standard errors, with $k-1$ lags, where k is the regression horizon. Data are quarterly from January 1976 until September 2013. Statistical significance levels at 5% and 1% are denoted by ** and ***, respectively.

Table 14. Bond Return Predictions - Horizon 1 Quarter

	High Yield		Investment Grade	
	R^2	CI [25, 75]	R^2	CI [25, 75]
Out-of-sample	0.053	[0.033 , 0.138]	0.033	[0.026 , 0.062]

Notes: We report out-of-sample percentage R^2 for OLS forecasts of 1-quarter bond excess returns from from January 1976 until September 2013 for investment grade bonds and from January 1987 to June 2013 for High-yield bonds. The predictor variable is *Dispersion* in credit quality. Our out-of-sample procedure splits the sample after the first 55 observations, uses the first 55 observations as a training window, and recursively forecasts returns using all available information to obtain parameter estimates, i.e. using an incrasing estimation window. We also report the 25-75 confidence interval for the R^2 computed using 1000 bootstrapped samples of the same size of the actual samples.

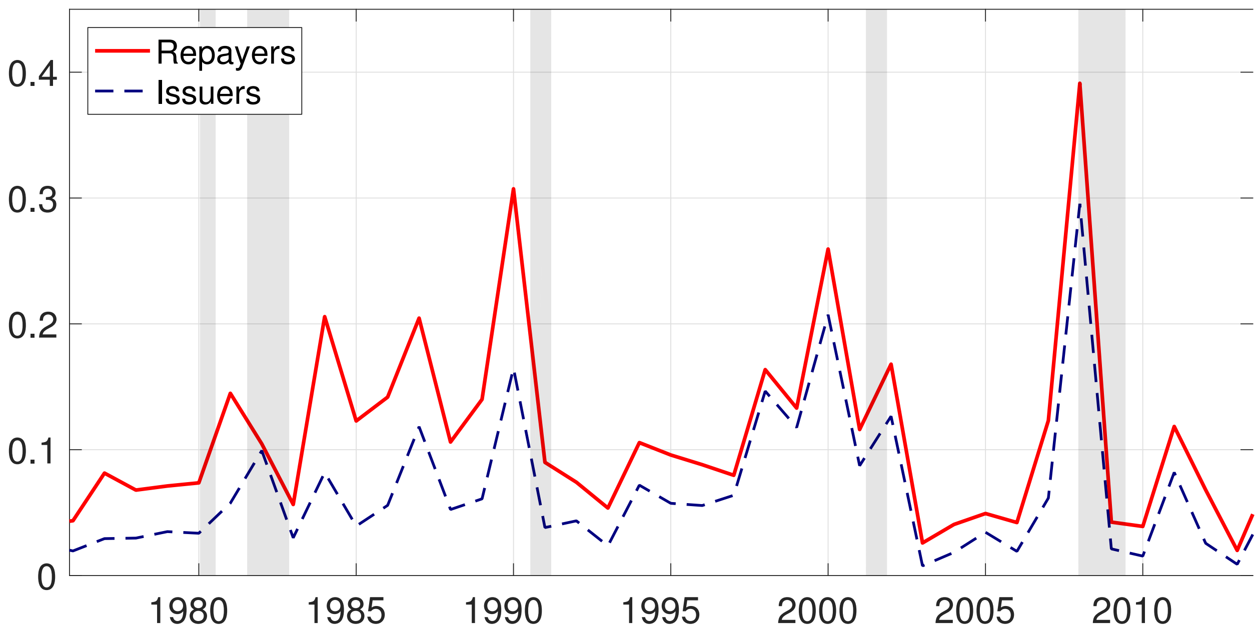

Fig. 1. **Expected default frequency: Cash-flows to Debtholders.** Each year, we sort firms in the data into quintiles based on cash-flows to debtholders. We define cash-flow to debtholders as long term debt repayed plus interest expenses minus change in short term debt and long term debt issued (from the statement of cash-flows). Repayers are the firms in the top quintile; issuers are the firms in the bottom. EDF is the annual expected default frequency from the Merton (1974) model. Shaded areas correspond to NBER recessions.

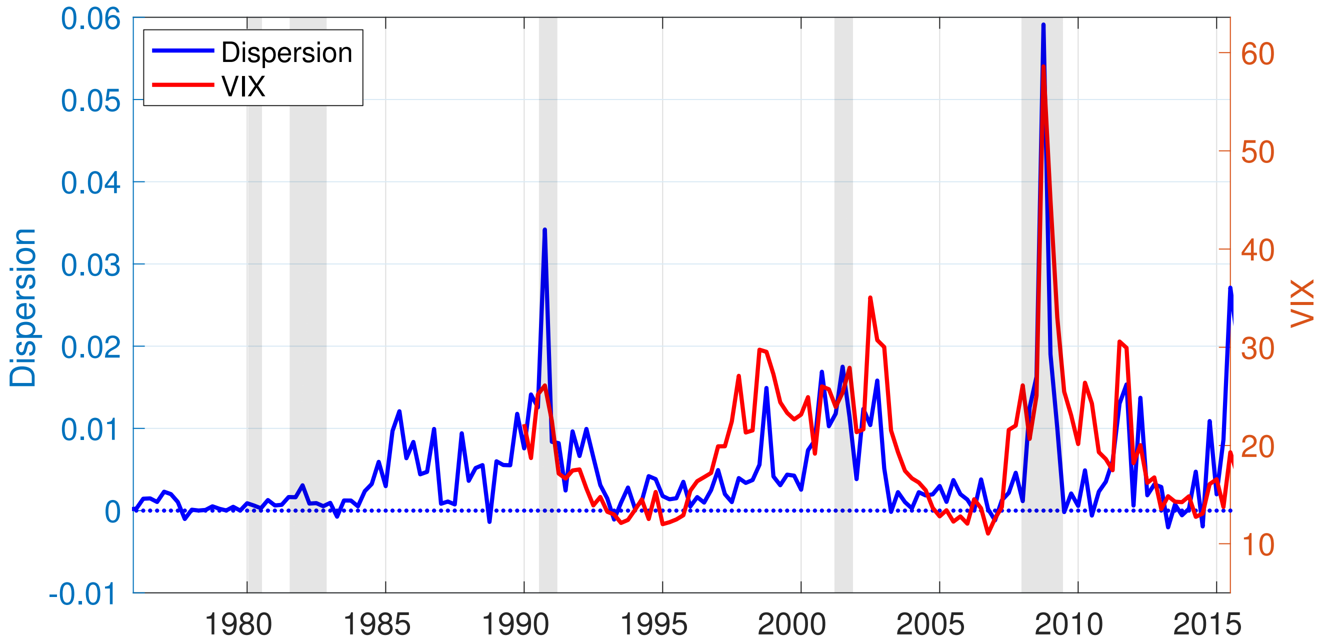

Fig. 2. **Dispersion and VIX.** The figure shows the dispersion between the average EDF for firms which repay their debt minus the average EDF for issuers and compares the series with the quarterly average of VIX. The shaded areas correspond to NBER recessions.

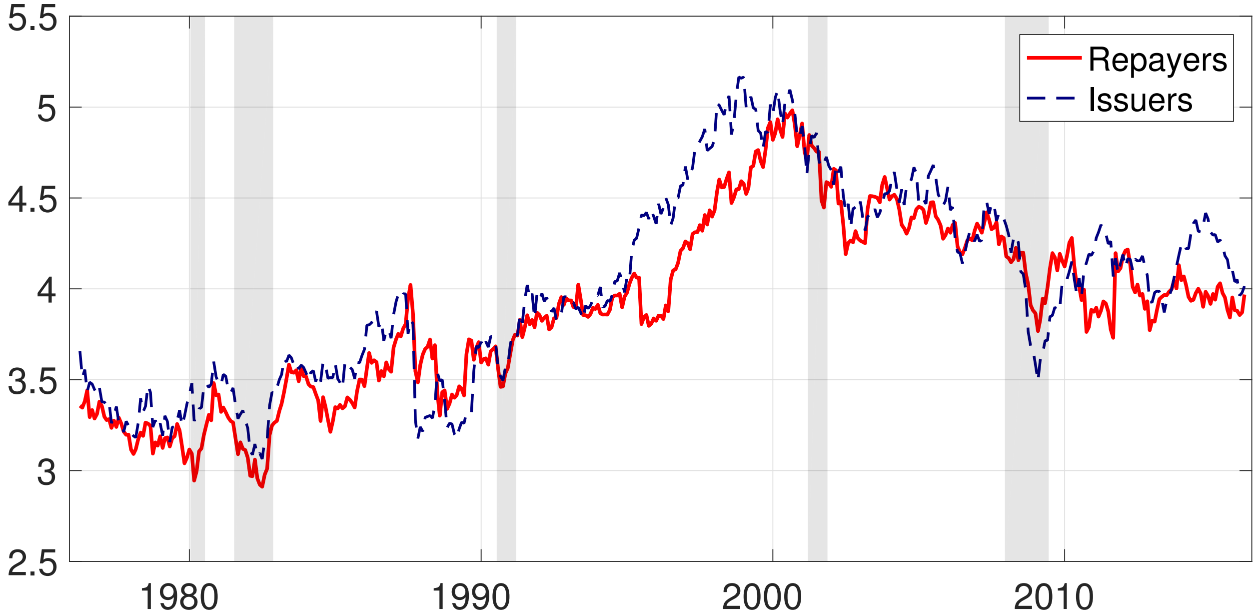

Fig. 3. **Price-dividend ratio.** The figure shows the log price-dividend ratio for repayers and issuers. To eliminate seasonality in dividends, we construct annualized dividends by adding the current months dividends to the dividends of the past 11 months. Prices are computed assuming no dividend reinvestment. Each quarter, we sort firms into quintiles based on debt repayment. We define debt repayment as the change in book value of equity minus change in book value of assets over the quarter divided by lagged book value of assets. Repayers (solid line) are the firms in the top quintile; issuers (dashed line) are the firms in the bottom.